Space Weather Forecast

Issued on Thursday, 02 November 2023 at 13:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further Moderate-class flares throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate, with the peak flare speculated to be from an unnumbered region that is now rotating onto the visible disc over the southeast limb. The most active region on the visible disc is the large region in the southwest quadrant, containing a moderately-large lead spot, a fragmented trailing region and somewhat complex magnetic configuration. All other regions on the visible disc appear magnetically simple at this time.

An eruption of a long rope of plasma (filament) from the northeast quadrant was observed leaving the sun early on 02 Nov. On initial analysis, much of the ejecta appears directed to the northeast, however it is currently being analysed for any potential Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar wind speeds remain at slightly elevated levels but are continuing to decline following the recent high-speed stream. Total magnetic field strength has been weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected, with a chance of further isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: A Coronal Mass Ejection (CME) that left the sun late on 31 Oct may give Earth a glancing blow late 04 Nov or early 05 Nov. A further CME that left the sun early on 02 Nov is currently being assessed, although appears unlikely to have a significant Earth-directed component. Fast solar winds are expected to ease from slightly elevated levels to background in the next 24 hours, with no further enhancements likely during the period. Mainly Quiet geomagnetic activity is expected with a chance of isolated Unsettled intervals. Any potential arrival of the CME from 31 Oct could see activity increase to Unsettled to Active levels late on day 3 (04 Nov) or early day 4 (05 Nov), but this is deemed unlikely.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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